



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Interstate Seed Company

Whereas, THERE HAS BEEN PRESENTED TO THE
Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT (PLANT VARIETY PROTECTION ACT, 7 U.S.C. 2321 ET SEQ.)

SUNFLOWER

'IS 2501'



In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington this 30th day of July in the year of our Lord one thousand nine hundred and eighty-one.

Attest:

Samuel H. Lane
Commissioner
Plant Variety Protection Office
Grain Division
Agricultural Marketing Service

John R. Block
Secretary of Agriculture

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

INSTRUCTIONS: See Reverse.

No certificate for plant variety protection may be issued unless a completed application form has been received (5 U.S.C. 553).

1a. TEMPORARY DESIGNATION OF VARIETY IS 2501		1b. VARIETY NAME IS 2501		FOR OFFICIAL USE ONLY PV NUMBER 8100026	
2. KIND NAME Sunflower		3. GENUS AND SPECIES NAME Helianthus annuus		FILING DATE 11/18/80	TIME 11:00 A.M.
4. FAMILY NAME (BOTANICAL) Compositae		5. DATE OF DETERMINATION February, 1980		FEE RECEIVED \$ 500.00 \$ 250.00	DATE 11/18/80 7/6/81
6. NAME OF APPLICANT(S) Interstate Seed Company		7. ADDRESS (Street and No. or R.F.D. No., City, State, and ZIP Code) P O Box 470, Fargo, ND 58107		8. TELEPHONE AREA CODE AND NUMBER 701-235-4431	
9. IF THE NAMED APPLICANT IS NOT A PERSON, FORM OF ORGANIZATION: (Corporation, partnership, association, etc.) Corporation		10. IF INCORPORATED, GIVE STATE AND DATE OF INCORPORATION North Dakota		11. DATE OF INCORPORATION November, 1917	
12. NAME AND MAILING ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS: Stan Rollin, Seed Consultant, 6802 Orem Drive, Laurel, MD 20810					

13. CHECK BOX BELOW FOR EACH ATTACHMENT SUBMITTED:

- ☒ 13A. Exhibit A, Origin and Breeding History of the Variety (See Section 52 of the Plant Variety Protection Act.)
- ☒ 13B. Exhibit B, Novelty Statement.
- ☒ 13C. Exhibit C, Objective Description of the Variety (Request form from Plant Variety Protection Office.)
- ☒ 13D. Exhibit D, Additional Description of the Variety.

14a. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? (See Section 83(a). (If "Yes," answer 14B and 14C below.)		<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
14b. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?	14c. IF "YES," TO 14B, HOW MANY GENERATIONS OF PRODUCTION BEYOND BREEDER SEED?		
<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	<input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED		
15a. DID THE APPLICANT(S) FILE FOR PROTECTION OF THIS VARIETY IN OTHER COUNTRIES? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO (If "Yes," give name of countries and dates.)			
15b. HAVE RIGHTS BEEN GRANTED THIS VARIETY IN OTHER COUNTRIES? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO (If "Yes," give name of countries and dates.)			

16. DOES THE APPLICANT(S) AGREE TO THE PUBLICATION OF HIS/HER (THEIR) NAME(S) AND ADDRESS IN THE OFFICIAL JOURNAL? ☒ YES ☐ NO

17. The applicant(s) declare(s) that a viable sample of basic seed of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

11-13-1980
(DATE)

Mona M. Hall
(SIGNATURE OF APPLICANT)

(DATE)

(SIGNATURE OF APPLICANT)

INSTRUCTIONS

GENERAL: Send an original copy of the application and exhibits, at least 2,500 viable seeds, and \$500 fee (\$250 filing fee and \$250 examination fee) to U.S. Dept. of Agriculture, Agricultural Marketing Service, Livestock, Poultry, Grain and Seed Division, Plant Variety Protection Office, National Agricultural Library Building, Beltsville, Maryland 20705. (See section 180.175 of the Regulations and Rules of Practice.) Retain one copy for your files. All items on the face of the form are self-explanatory unless noted below.

ITEM

- 5 Give the date the applicant determined that he had a new variety based on (1) the definition in section 41(a) of the Act and (2) the date a decision was made to increase the seed.
- 13a Give: (1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method; (2) the details of subsequent stages of selection and multiplication; (3) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified and (4) evidence of uniformity and stability.
- 13b Give a summary statement of the variety's novelty. Clearly state how this novel variety may be distinguished from all other varieties in the same crop. If the new variety most closely resembles one or a group of related varieties: (1) identify these varieties and state all differences objectively; (2) attach statistical data for characters expressed numerically and demonstrate that these differences are significant; and (3) submit, if helpful, seed and plant specimens or photographs of seed and plant comparisons clearly indicating novelty.
- 13c Fill in the Exhibit C, Objective Description form, for all characteristics for which you have adequate data.
- 13d Describe any additional characteristics that are not described, or whose description cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the description of characteristics that are difficult to describe, such as, plant habit, plant color, disease resistance, etc.
- 14a If "YES" is specified (seed of this variety be sold by variety name only as a class of certified seed) the applicant may NOT reverse his affirmative decision after the variety has either been sold and so labeled, his decision published, or the certificate has been issued. However, if the applicant specified "NO," he may change his choice. (See section 180.16 of the Regulations and Rules of Practice.)
- 15a See section 42 of the Plant Variety Protection Act and section 180.7 of the Regulations and Rules of Practice.

NOV 18 1980

Interstate Seed Co., Fargo, N.Dak.
Appl. No. 8100026
Sunflower Inbred Line IS2501

13-a. Exhibit A - Origin and Breeding History

1. Pedigree: IS2501 originated from following cross:
Morden Gene Pool Composite X PI 287230.

- a. Origin and source of Morden Gene Pool Composite:

The Morden gene pool composite is a bulk of selected sunflower inbred lines grown under one cycle of random mating or open pollination. The composite was formed by CDA (Canada Department of Agriculture), Morden, Manitoba. There was no public release of the composite by the CDA as far as we know. However, seed was made available to plant breeders to be used as a breeding source. The CDA plant breeder responsible for seed distribution was Dr. Walter Dedio, Research Branch, Canada Agriculture, Research Station, P.O. Box 3001, Morden, Manitoba, Rog IJO phone 204-822-4471.

- b. Origin and Source of PI 287230

The PI 287230 was obtained from North Central Regional Plant Introduction Station, Ames Iowa. It is an introduction of the Russian open pollinated variety ENISEJ - (See attached sheets)

2. Breeding Methodology used in developing IS2501:

The components of the cross were highly variable and segregating for various criteries. Selection of the parental plants was based on plant height, stalk strength and maturity. The pedigree and progeny selection methods were used in developing IS2501. A bulk of the highly productive F4 families was used in increasing IS2501. Selection for plant uniformity and homogeneity was practiced during the increase. Harvested seed was used to form the breeder seed of IS2501.

3. Stability and Variants:

During foundation seed increases of IS2501 we have observed that uniformity for plant height and maturity were stable. We have also noticed a low frequency of plants with upright heads (head angle is 90 degrees from the stalk instead of the usual 45 degree angle). The percentage of the previous variants is shown in the following table.

8100026

Interstate Seed Co., Fargo, N.Dak.
Cont. Appl. No. 8100026
13-a.

Page 2

Table 4 - Percentage of Variants in Sunflower
inbred line IS2501

Year and Location	# Plants Observed	# Variants	% Variants
1980 Homestead, FL.	4,900	6	0.15
1980 Marshall, MN	55,000	11	0.02

SUNFLOWER INBRED LINE IS2501

13. a. Exhibit A = Origin and Breeding History.

Pedigree:

Morden Gene Pool Composite X PI28730

IS2501 is derived from the fifth generation of the above cross. Selection in the F₁ generation and the subsequent generation was based on plant height, stalk strength and verticillium wilt resistance. The pedigree method was used for breeding. Several F₄ families were selected based on combining ability and the lack of fertility restoration genes.

A bulk of the most homogeneous f₄ families was used to form the breeder seed of IS2501. Breeder seed was increased in two (2) subsequent generations and selection for plant uniformity was practiced.

During our seed increase program IS2501 appears to be stable and uniform.

IS2501 will be used presently for the production of three-way hybrid sunflowers when its sterilization is completed it will be used for single cross hybrid production.

Amendment to Ex. B - Application No. 8100026, 'IS 2501'

'IS 2501' differs from its most similar variety 'HA 89' with respect to the days from seedling emergence to physiological maturity, width-length ratio of leaves, leaf apex, leaf base, and leaf margin as shown in the following tables:

<u>Width:length Ratio of Leaves</u>	<u>Leaf Apex</u>	<u>Leaf Base</u>	<u>Leaf Margin</u>	<u>Variety</u>
Equal	Acuminate	Auriculate	Coarsely crenate	IS2501
Narrower than long	Acute	Truncate	Finely crenate	HA 89

	<u>Days to Physiological Maturity</u>	
	<u>HA 89</u>	<u>IS 2501</u>
1979	98	91
1980	95	89

Interstate Seed Co. Fargo, N.Dak.

Appl. No. 8100026
Sunflower Inbred Line IS2501

13b - Exhibit B - Novelty Statement
IS2501 is most similar to HA89 but differs in the following characteristics:

1. Stalk strength and lodging resistance:
Data collected from different locations over two years have shown that IS2501 is more lodging resistant than HA89.

Table 1-a. Percentage of lodged plants of
sunflower inbred lines HA89 and IS2501

Year and Location	HA89 %	IS2501 %
1979 Casselton, ND	8.5	2.5
1979 Hunter, ND	9.0	3.0
1980 Homestead, FL	15.0	8.0
1980 Glyndon, MN	6.0	2.0
1980 Hunter, ND	8.0	4.5

Table 1-b. Stalk strength scores* of
sunflower inbred lines HA89 and IS2501

Inbred Line				
Year and Location	HA89		IS2501	
	# plants	Average Score	# plants	Average Score
1979 Casselton, ND	145	4.0	130	3.0
1979 Hunter, ND	85	4.5	80	2.5
1980 Homestead, FL	102	3.5	110	2.0
1980 Glyndon, MN	190	5.0	130	1.5
1980 Hunter, ND	110	4.0	120	2.0

* Stalk strength scale 1 to 9
1=Very strong and resists breaking
9=Very weak and breaks easily

Interstate Seed Co.
Cont. Appl. #8100026
13-b.

Page 2

2 - Seed dry down=

Our data have shown that IS2501 has faster dry down characteristics than HA89.

Table 2-a. Moisture % of seed at harvest
for sunflower inbred lines HA89 and IS2501

	Year and Location	HA89	IS2501
		%	%
1979	Casselton, ND	14	11
1980	Glyndon, MN	12	8

Table 2-b. Number of days from seedling emergence
to physiological maturity of sunflower inbred lines
HA89 and IS2501

	Year and Location	HA89	IS2501
1979	Casselton, ND	98	91
1980	Glyndon, MN	95	89

Interstate Seed Co.
Cont. Appl #8100026
13-b.

Page 3

3 - Percentage of Decortication-

Our data shows that IS2501 seed coat appears to be more fragile and shattering susceptible than HA89. This criteria may prove to be of a value for seed processing since hull removal is important in reducing the fiber content of the sunflower meal. The following table compares the difference in the percentage of hullability between IS2501 and HA89.

Table 3. Hull % removed from lines HA89 and IS2501

Inbred Line	Sample Weight gms	Sample #1	Sample #2	Sample #3	Sample #4	Average
HA 89	200	4.95	5.05	4.96	4.89	4.96
IS 2501	200	7.45	7.40	7.56	7.42	7.46

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, POULTRY, GRAIN & SEED DIVISION
BELTSVILLE, MARYLAND 20705

EXHIBIT C
(SUNFLOWER)

OBJECTIVE DESCRIPTION OF VARIETY
SUNFLOWER (HELIANTHUS ANNUUS)

NAME OF APPLICANT(S)

Interstate Seed Company

VARIETY NAME OR TEMPORARY DESIGNATION

IS 2501 Inbred Line

ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code)

417 Main
P O Box 470, Fargo, North Dakota 58701

FOR OFFICIAL USE ONLY

PVPO NUMBER

8100026

Place numbers in the boxes (e.g.) for the characters that best describe typical plants of this variety. The symbol ▲ indicates decimal.

COMPARISON VARIETIES

NON-OIL: 1 = ARROWHEAD

2 = MINGREN

3 = SUNDAK

OIL: 4 = PEREDOVIK

5 = KRASNODARETS

6 = OTHER

HA89

1. CLASS:

1 = OIL TYPE 2 = NON-OIL TYPE (confectionery)

2. MATURITY:

NO. OF DAYS TO HEAD FIRST VISIBLE
(from emergence)

NO. OF DAYS TO HARVEST RIPENESS (from emergence)

DAYS EARLIER THAN

DAYS EARLIER THAN

HEADING SAME AS

COMPARISON
VARIETY

MATURITY SAME AS

COMPARISON
VARIETY

DAYS LATER THAN

DAYS LATER THAN

3. HEIGHT:

cm TALL AT HARVEST RIPENESS

cm SHORTER THAN

SAME AS

COMPARISON
VARIETY

cm TALLER THAN

4. STEM:

LENGTH OF INTERNODE AT HARVEST RIPENESS

NUMBER OF LEAVES

CM. SHORTER THAN

FEWER LEAVES THAN

SAME AS

☒COMPARISON
VARIETY

SAME AS

☒COMPARISON
VARIETY

CM. LONGER THAN

MORE LEAVES THAN

BRANCHING:

1 = NO BRANCHING

3 = TOP BRANCHING (with central head)

2 = BASAL BRANCHING

4 = FULLY BRANCHED (without central head)

COLOR OF GROWING POINT: 1 = GREEN 2 = YELLOW

3

5. LEAVES (Midstem at flowering):

2 3 0 CM. BLADE LENGTH

2 3 0 CM. BLADE WIDTH

3 0 CM. SHORTER THAN

6

2 0 CM. NARROWER THAN

6

LENGTH SAME AS

6

COMPARISON
VARIETY

WIDTH SAME AS

6

COMPARISON
VARIETY

CM. LONGER THAN

6

CM. WIDER THAN

6

2 WIDTH: LENGTH RATIO: 1 = NARROWER THAN LONG 2 = EQUAL 3 = WIDER THAN LONG

1 LEAF SHAPE: 1 = CORDATE 2 = OTHER

1 LEAF APEX: 1 = ACUMINATE 2 = OTHER

1 LEAF BASE: 1 = AURICULATE 2 = TRUNCATE

3 LEAF MARGIN: 1 = ENTIRE 2 = FINELY CRENATE 3 = COARSELY CRENATE 4 = OTHER

2 DEPTH OF MARGIN INDENTATIONS: 1 = SHALLOW 2 = INTERMEDIATE 3 = DEEP

2 ATTITUDE: 1 = ERECT 2 = ASCENDING 3 = HORIZONTAL 4 = DESCENDING

2 SURFACE: 1 = SMOOTH 2 = CRINKLED (ridged) 3 = OTHER

2 COLOR: 1 = LIGHT GREEN 2 = GREEN 3 = DARK GREEN 4 = BROWN

1 MARGIN COLOR: 1 = GREEN 2 = YELLOW

6. HEAD AT FLOWERING:

2 RAY FLOWERS: 1 = ABSENT 2 = PRESENT

1 RAY FLOWER COLOR: 1 = YELLOW 2 = SULFUR YELLOW 3 = ORANGE YELLOW 4 = OTHER

1 DISK FLOWER COLOR: 1 = YELLOW 2 = RED 3 = PURPLE

1 ANTHOCYANIN IN STIGMAS: 1 = ABSENT 2 = PRESENT

2 POLLEN COLOR: 1 = WHITE (colorless) 2 = YELLOW

1 PAPPI: 1 = GREEN 2 = RUST (red)

5 7 0 MM. RAY LENGTH

1 7 0 MM. RAY WIDTH

MM. SHORTER THAN

6

MM. NARROWER THAN

6

SAME AS

6

COMPARISON
VARIETY

SAME AS

6

COMPARISON
VARIETY

MM. LONGER THAN

6

MM. WIDER THAN

6

NOV 18 1980

10

7. HEAD AT SEED MATURITY:

1 7 0

CM. DIAMETER

0 1 5

CM. NARROWER THAN

6

SAME AS

COMPARISON VARIETY

CM. WIDER THAN

2

RECEPTACLE SHAPE: 1 = FLAT 2 = CONVEX 3 = CONCAVE

1

HEAD ATTITUDE: 1 = VERTICAL (*erect*) 2 = ASCENDING 3 = HORIZONTAL 4 = DESCENDING

1 0 0 5

NO. OF SEEDS PER HEAD

1 1 5

SEEDS / HEAD LESS THAN

6

SEEDS / HEAD SAME AS

COMPARISON VARIETY

SEEDS / HEAD MORE THAN

8. SEEDS:

3

OUTER PERICARP: 1 = CLEAR 2 = STRIPED BLACK 3 = NEARLY SOLID BLACK

1

MIDDLE PERICARP: 1 = WHITE 2 = SOLID PURPLE

1

INNER PERICARP (*seed coat*): 1 = NO COLOR 2 = BROWNISH BLACK

4

STRIPES: 1 = ABSENT 2 = EVEN BLACK & WHITE STRIPES 3 = BROAD BLACK & NARROW WHITE

4 = BLACK WITH NARROW DARK-GREY STRIPING 5 = OTHER

1

MOTTLING: 1 = ABSENT 2 = PRESENT

1

SHAPE: 1 = OVATE 2 = OBOVATE (*shield*) 3 = NARROWLY OBOVATE 4 = OBLONG 5 = ELLIPTIC

1

SHAPE (*cross-section*): 1 = NOT CURVED 2 = CURVED

0 9 2

MM. LENGTH

0 4 3

GM. / 100 SEED

1 1

MM. SHORTER THAN

6

SAME AS

COMPARISON VARIETY

MM. LONGER THAN

GM. HEAVIER THAN

COMPARISON VARIETY

0 0 0

% HELD ON 7.9 MM. (20/64) ROUND-HOLE SCREEN

% LESS THAN

SAME AS

6

COMPARISON VARIETY

% MORE THAN

9. DISEASE AND INSECTS (0 = Not tested, 1 = Susceptible, 2 = Resistant):

☒ 1 RUST (*Puccinia helianthi*)GIVE RACES: Race 1☒ 2 VERTICILLIUM WILT (*Verticillium dahliae*)☒ 1 DOWNY MILDEW (*Plasmopara halstedii*)☒ 0 WHITE BLISTER RUST (*Albugo tragopogi*)☒ 0 BROOM RAPE (*Orobancha cannis*)

GIVE RACES: _____

☒ 0 EUROPEAN SUNFLOWER MOTH (*H. nebullela*)☐ OTHER (specify) _____☒ 1 SCLEROTINIA WILT (*Sclerotinia sclerotiorum*)☒ 2 LEAF MOTTLE (*V. albo-atrum*)☒ 1 GRAY-MOLD BLIGHT, BUD ROT (*Botrytis cinerea*)☒ 0 CHARCOAL ROT, STEM ROT (*Macrophomina phaseolina*)☒ 1 SUNFLOWER MOTH, N. AMERICAN HEAD MOTH
(*Homoeosoma electellum*)☐ OTHER (specify) _____☐ OTHER (specify) _____

10. GIVE VARIETY OR VARIETIES THAT MOST CLOSELY RESEMBLE THE SUBMITTED VARIETY. For the following characteristics

indicate degree of resemblance by placing in the column marked, D.R., one of the following numbers:

1 = Submitted variety is less, lighter or inferior than comparison variety 2 = Same as 3 = More than, darker, or superior

CHARACTER	VARIETY	D.R.	CHARACTER	VARIETY	D.R.
Frost resistance	6	2	Leaf attitude	6	2
Lodging resistance	6	3	Head attitude	6	1 3
Neck or stem strength	6	3	Ray flower color	6	2
Branching type	6	2	Seed shape	6	1 3
Petiole length	6	3	Seed color	6	2
Leaf shape	6	2	Seed striping pattern	4	2
Leaf color (green)	6	2	Seed yield	6	2

11. GIVE THE FOLLOWING DATA FOR SUBMITTED AND A SIMILAR VARIETY*.

VARIETY	HULL (%)	PROTEIN (%)	OIL (%)	IODINE NO.	FATTY ACIDS	
					OLEIC (%)	LINOLEIC (%)
Submitted		21	38.20	127	18.4	68.9
Similar		21.9	43.70	124	28.6	61.2
Name of similar variety HA89		HA89	HA89	HA89	HA89	HA89

* Hull, protein and oil percentages expressed for whole undecorticated seed; acids expressed as percentages of oil

12. COMMENTS:

NOV 18 1980

SUNFLOWER INBRED LINE IS2501

13. d. Exhibit D. Additional Description of IS2501.

The line has a good combining ability with CmsHA89 and produces a uniform medium height sterile single female. This is beneficial from the standpoint of seed production of the three-way hybrids. In our limited testing the three-way hybrids using IS2501 as one of the parents appear to be almost as uniform in height and maturity as single cross hybrids. The stalk quality and disease resistance of hybrids using IS2501 also appears to be satisfactory.